

Application No. 10/664,908
Amendment Under 37 C.F.R. §1.111 dated September 2, 2004
Response to the Office Action of May 12, 2004

REMARKS

Claims 1-7 and 10-16 were cancelled without prejudice or disclaimer. Claim 8 and 9 remain pending in the present application. The rejections set forth in the Office Action are respectfully traversed below.

Rejections Under 35 U.S.C. §112, Second Paragraph

Claims 8 and 9 were rejected under 35 U.S.C. §112, second paragraph. These were amended to clarify features alleged to be indefinite in the Office Action.

It is noted that independent claim 8 was not rejected over the prior art. Since claim 8 now meets all the requirements under 35 U.S.C. §112, second paragraph, and there is no other rejection thereof, claim 8 is now in condition for allowance.

Rejections Under 35 U.S.C. §102

Claim 9 was rejected under 35 U.S.C. §102 over **Osgood et al.** (USP 6,355,934). It is submitted that nothing in the cited prior art teaches or suggests a mirror, as recited in claim 9, that has approximately the same area as that for the diameter of said excitation light beam. The cited prior art does not disclose this feature for the allegedly corresponding mirror 70 of **Osgood**.

As described, for example, on page 15 of the present specification, the use of the present claimed mirror having an area approximately equal to that of the diameter of the excitation light beam results in preventing the reflected excitation light being incident to the detector. In contrast, nothing in **Osgood** teaches or suggests the mirror 70 as having an area that is limited to

approximately the area for the diameter of the excitation light beam. Accordingly, the prior art would transmit reflected excitation light to the detector. This is directly contrary to the present claimed invention. For at least these reasons, the present claimed invention patentably distinguishes over the prior art.

Furthermore, in all of the three cited references, a collimated narrow laser beam is used as incident excitation light. Therefore, these cited references have the following restrictions.

- 1) At least a diameter of approximately 1mm is necessary to collimate a laser beam.
- 2) If the laser beam (from the approximately 1mm diameter) is made incident on an objective lens, for example, with an object lens with a magnification of 100 for a microscope, the incident diameter is 4 mm, NA is 0.9, λ is 0.5 μm , and f is 2 m. On the assumption that the diameter of an incident beam is 1 mm, NA is approximately $0.5/2 = 0.25$. Therefore, pinpoint illumination within only a range of the diameter of $d = 1.22 \times \lambda / \text{NA} = 2.4 \mu\text{m}$ is performed and no excitation occurs outside of this range.

- 3) Therefore, if the XY scanning type is not used, it is not possible to observe the whole biochip.

- 4) As the excitation with a diameter of 1 mm is cut by a mask or mirror with respect to the incident diameter of 4 mm, the intense fluorescent light at the central part is eliminated and therefore the quantity of fluorescent light is significantly reduced.

In contrast to these deficiencies of the cited prior art, the present invention assumes that excitation is performed using the whole objective lens as shown in Fig. 12 (claim 8) and Fig. 13

(claim 9), as in an ordinary fluorescent microscope. Therefore, the present invention has the following advantages.

- 1) The whole visual field of a sample can be observed without scanning.
- 2) Since pinpoint illumination can be performed as shown in Fig. 13, the mirror can be miniaturized.

For example, $d = 1.22 \times \lambda / NA = 0.7 \mu\text{m}$ ($NA = 0.9$). Therefore, a sufficient quantity of fluorescent light can be directed to the photodetector.

The present invention differs from all of the cited references in the following two features. That is, in the case where a collimated excitation light is cast on a flat biochip via the objective lens 13, since the mask or mirror is arranged at a position where the return light from the biochip surface is focused on the rear side of the objective lens (where its sample side is considered to be the face side), the area of the mask or mirror is minimized, and the entire incident excitation light is condensed (by the lens 41) on the mask or mirror with the minimum area. For at least these further reasons, the present invention distinguishes over the prior art.

Corrections to Status of Fig. 3

Amendments were made to the Specification and Drawings to correct an error regarding the status of Figures 3, 4A, and 4B, as well as errors in the light intensity distribution curve depicted in Figure 3. These errors were recently discovered by the inventor, Takeo Tanaami.

In particular, Figure 3 is not "prior art." Instead, Figure 3 is based on the subject matter described in the inventors' related Japanese Patent Application No. 2001-2264. Basically,

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Figure 3 relates to the inventors' own work. Figures 4A and 4B relate to Figure 3. All references to Figures 3, 4A and 4B as being "prior art" or being "conventional" in the specification and drawings are incorrect. As indicated on page 4, lines 17 – 20, "Figure 3 is a schematic view of the biochip reader using a microlens array system illustrating its principle and configuration, mentioned in Japanese Patent Application No. 2001-2264 *submitted by the applicant concerned.*" The Applicants of the present U.S. application are the same Applicants of Japanese Patent Application No. 2001-2264 (see, also, U.S. Patent No. 6,494,373, submitted with the concurrently filed Information Disclosure Statement).

A Declaration Under 37 C.F.R. §1.132 executed by Takeo Tanaami, one of the inventors of the present application, is attached to attest to the origins of the subject matter described in Figure 3 of the present application in support of the present corrections thereto.

Neither Japanese Patent Application No. 2001-2264 nor its corresponding U.S. Patent No. 6,494,373 constitute prior art under any provision of 35 U.S.C. §102. As stated by the Federal Circuit in *Riverwood Int'l Corp. v. R. A. Jones & Co., Inc.*, 324 F.3d 1346, 66 U.S.P.Q. 2d 1331, (Fed. Cir., 2003), "one's own work may not be considered prior art in the absence of a statutory basis." According to the Federal Circuit's Decision in *Riverwood*, Applicant's are permitted to correct mistaken admissions of "prior art" when such mistaken "prior art" was actually the Applicant's own work. As mentioned above, and as supported by the attached Declaration from one of the inventors, Figures 3, 4A and 4B are based on the Applicants' own work. The mistake in labeling and describing the subject matter of these drawings as prior art

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arose without any deceptive intent, and are being corrected by this Submission. It is submitted that no new matter was added.

The light intensity distribution curve depicted in Figure 3 was also corrected by this amendment. In particular, the specification stated that the light intensity distribution curve depicted in Figure 3 has the ratio α as 10 – 20% (see e.g. page 5, lines 15 – 19). However, the originally depicted ratio α in Figure 3 looks substantially similar to the ratio α of the light intensity distribution curve depicted in Figure 16. This is incorrect. The light intensity distribution curve depicted in Figure 3 having the ratio α as 10 – 20% should be noticeably different than the light intensity distribution curve depicted in Figure 16 that is described in the present specification to have the ratio α of about 90% (see e.g. page 17, line 22 to page 18, line 1). Accordingly, Figure 3 was corrected above to better reflect the description thereof in the specification. Again, no new matter was added.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact the undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

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In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 50-2866.

Respectfully Submitted,

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Enclosures: 1 sheet of Corrected Formal Drawing (Figs. 3, 4A and 4B);
Rule 132 Declaration
Information Disclosure Statement (with 1 reference).

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Amendments to the Drawings

The attached one sheet of drawings is the *replacement* corrected *formal* sheet of drawings including changes to Figs. 3, 4A, and 4B. The light intensity distribution curve depicted in Figure 3 was corrected to correspond with the description in the present specification to have the ratio α as 10 – 20% (see e.g. page 5, lines 15 – 19), which should be noticeably different than the light intensity distribution curve depicted in Figure 16 that is described in the present specification to have the ratio α of about 90% (see e.g. page 17, line 22 to page 18, line 1).

Attachment: 1 Replacement Sheet (including Figures 3, 4A and 4B)